SYMONS'S
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# METEOROLOGICAL MAGAZINE.

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## HAILSTORM AT SEAFORD, SUSSEX, MAY 30TH, 1897.

IT is very rare for it to be possible to prove that in England, over a considerable area, a shower of hailstones has fallen each of which was as large as a hen's egg. This we are in a position to do, thanks to the following correspondence, and to two different photographs with which also we have been favoured. We intend to give (1) letters received from observers personally known to us; (2) verbatim reprints from local and other newspapers; (3) condensed notes from various sources; (4) a brief commentary on the whole.

*To the Editor of the Meteorological Magazine.*

SIR,—As I have not seen in a London or other paper any notice of a curious storm here, last Sunday, May the 30th, I send you some remarks in case you care to note them.

It had been an exceedingly hot day, with scarcely a breath of wind on the high cliffs towards Beachy Head, and during the afternoon light clouds covered the sky. At about 6.30 p.m. a dark cloud, with two long streamers apparently issuing from the sea, approached from the south, and on nearing the shore the calm surface of the water was suddenly covered with heavy splashes, as if a vast shower of big stones had been thrown in. Half a minute later hailstones fell on the land, varying in size from that of a small marble to four or even five inches round. The large stones all had a round nucleus of opaque white frozen snow, about half-an-inch in diameter, and this was surrounded by a ball of transparent ice. As these ice-balls of the largest size fell on an average ten feet apart, they did not do so much damage as would have taken place had they been closer together, but they broke every pane of glass exposed horizontally to their force. After the hail had fallen for two or three minutes, another five minutes of very heavy rain followed, and when I ran out, on this ceasing, to pick up two big hailstones which I saw on the road, I found on measuring them that they were $4\frac{1}{2}$ inches round. As these had been exposed fully seven minutes on the ground, and for five out of the seven to rain, I conclude that they were

originally somewhat larger. When the storm was over, very many persons came out and collected the large hailstones in bags; I wondered why.

In 1846 a similar storm occurred at Herne Hill, where my father lived, and in a very few minutes glass in his conservatories to the value of nearly £400 was destroyed, but I do not remember any other.

The glass used now is much stronger than it was in 1846, and in greenhouses especially; I noticed that last week the window-panes escaped very generally, whereas I am sure they would have been broken had the old glass been there.

It appears that the hail was most local, for it did not fall two miles off East or West.—Most sincerely yours,

A. S. BICKNELL.

*5, Esplanade, Seaford, Sussex.*

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SIR,—The weather on 30th, though very warm, was lovely in the morning and afternoon; but towards 5 p m. clouds began to draw up from the S.W., and about 6 p.m. there was distant T, which came closer. I counted 14 slowly between the L and the T. The remarkable feature was the large H; a quarter of an hour after the stones had fallen I saw three each measuring $1\frac{3}{4}$ in. by $1\frac{1}{8}$ in., slightly flattened and with a nodulated surface. A friend picked up several $4\frac{1}{4}$ in. in circumference. Several of the large ones left in a hot kitchen for four hours were found to have melted only to the size of small marbles; must not the ice have been exceptionally cold? Twigs and branches were cut off as with a knife, and much glass was broken.—Yours truly,

*York House, Seaford, May 31st.* A. ALDAM MOON.

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SIR,—Reports having reached me respecting the severe hailstorm which swept across this county on Sunday evening, May 30th, I am induced to send you the following account, furnished to me by the Rev. Chancellor Parish, of what occurred at his Vicarage of Selmeston, near Polegate.

> "I am anxious to describe, as well as I can, the hailstorm which fell upon us yesterday (May 30th), as I am sure you must have watched it from a distance with great interest. The storm clouds drew up from the S.W., and I remarked them about 2.30, but they advanced slowly till they appeared all around us; at about 6 p.m., I came indoors and made my notes of the services of the day, &c., I then observed that it became vary dark, and suddenly, between 15 and 20 minutes past six, a terrific storm of wind and rain swept down upon us. I walked to the window of my study to look at it, and the rain changed to hail, and the stones became larger and larger till their size was quite alarming. The whole duration of the storm was, as near as I could guess (without having timed it),

six minutes or seven—viz., two minutes rain; one minute ordinary hail the size of a pea (diameter 0·1 in. to 0·2 in.); two minutes larger stones, the size of small marbles (diameter 0·4 in. to 0·5 in.); two minutes largest size of irregularly oval shape, (about 1½ inches by ¾ inch). My drawing-room window and door were wide open, and the storm swept right through. Twenty-five panes of glass were completely smashed, and the shattered fragments were scattered all over the room. The floor was covered with hailstones. The noise was tremendous, and almost silenced the sound of the thunder, which was incessant. As the storm approached, some swallows made immense and successful efforts to get *above it.* They went almost straight up in the air, and when the storm suddenly ceased, there they were—high and dry. I should like to have seen it from their point of view. One feature was the surprising way that the stones bounded straight up off the lawn, more than two feet, I judge by the height of my railings. The rainfall here was only ·31 in. as measured at 9 a.m., 31st."

At Sherrington Manor, a short distance from Selmeston, sad havoc was made upon the conservatories and hot-houses, not only the glass being broken, but the valuable plants very much injured.

From Crowborough I watched the progress of the clouds for some hours. Very heavy electric clouds appeared over the South Downs, near Newhaven, soon after 3 p.m., and for some time remained almost stationary. A rather strong easterly wind was blowing over Crowborough Hill at the time, which seemed to prevent the storm advancing in our direction; this wind at last increased in force, and apparently drove back the advancing clouds upon the main mass of the storm. Soon after six p.m., a line of nimbus cloud, two or three miles in length, of a whitish appearance, exhibited a well-defined edge on the northern side, and any further advance of the storm in our direction was checked. After passing over Seaford and Selmeston, it rapidly increased its pace, and finally disappeared to the eastward.

A rain storm, which passed over Crowborough from 6.55 to 6.59 p.m., came from quite another direction, viz., from the N.W. It came on quite suddenly with a vivid flash of lightning and unusually loud thunder. The rain fell in torrents for four minutes, when it ceased as suddenly as it had commenced. The rainfall was just ·30 of an inch in the time. No hail fell here.

I enclose some newspaper cuttings respecting this storm, and also a photograph of a group of hailstones which fell at Seaford, in fac-simile size. Such large hailstones have not fallen in Sussex since Aug. 23rd, 1855, when they were ordinarily the size of pullets' eggs, and some much larger, measuring from three to six inches in circumference.

Yours truly,

C. LEESON PRINCE, F.R.Met.S.

*The Observatory, Crowborough Hill, June 5th, 1897.*

## REMARKABLE HAILSTONES.

*To the Editor of the "Morning Post."*

SIR,—It would be interesting to know whether other places experienced the wonderful storm which visited us last Sunday, May 30th. At about 6.30 p.m. there fell for the space of some minutes a shower of hailstones varying in size from a hen's to a pigeon's egg, some of which weighed three-quarters of a pound each,* and measured over 5 in. in circumference. They had the appearance of balls of ice, with a coarsely granulated surface, and the centre of each was rayed like a crystalline star. The sight was a memorable one, and the damage done to the glass in the town and neighbourhood was very considerable.—Yours, &c., E. DEVERSON.

*Seaford, Sussex, June 5th.*

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## A SHOWER OF ICE.

ON Sunday evening, Seaford and the immediate district to the westward, were subjected to a sort of bombardment by a furious shower of ice, large frozen lumps and fragments crashing down with tremendous force, for a brief space of time. A hailstorm in summer is an unusual event, but a storm, whose hail consists, as it did on Sunday, of pieces of ice, most of which were considerably more than an ounce in weight, is a marvellous occurrence—at least in this country. In the tropics, according to travellers' tales, such a hail would not be regarded with surprise. Many of the hailstones which fell on Sunday were globular in shape, and were as large as a golf ball, though a few were equal in size to a small orange. Several of these, on being examined, were seen to have cores from which radial lines extended. Others were as large as a hen's egg, while some were angular in shape. Hailstones which were compared to cocoa-nuts for magnitude, were reported to have fallen, but their apparent size seems to have been due to the spectacles through which they were viewed. Ten "stones," picked up without making any selection as to bulk, weighed a pound, *and one was found which turned the scale at four ounces.* Others were put into the scale with the object of ascertaining the quantity of fluid resulting from liquefaction, and one was said to have filled, when melted, a "three measure of Scotch," whatever that may be, but a small wine glass, which the water from another filled, is a vessel whose capacity will be more generally understood. The shower of ice lasted only a few minutes, but it is scarcely necessary to state that it practically wrecked every greenhonse in the district. Much damage was also done to glass in a perpendicular position, and many

* This is a mistake, or misstatement. The *dimensions* given by the writer agree with those of other persons, and with the photographs, but the *weight* is at least three times too great. "Three-quarters of a pound" of ice is about 22 cubic inches; but the largest hen's egg may be taken as 4 cubic inches, and if so, then the "$\frac{3}{4}$ lb." is about five times too great. Probably the writer meant 3 oz., which would be very probable.—ED. *M.M.*

P.S.—We are glad, at the very moment of sending this for press, to be able to clear up the puzzle. We communicated with the writer, and find that *three* weighed $\frac{3}{4}$ lb., so that they averaged 4 oz. each; and she adds that several which she "handled were certainly much larger than hen's eggs"; this agrees very well with the "4 oz." She "heard of" five turning the scale at $1\frac{1}{2}$ lbs., *i.e.*, 4·8 oz. each, but did not see it. Our correspondent mentions also the extreme density of the ice to which attention is drawn on p. 66.—ED. *M.M.*

windows in the houses along Claremont Road, and on the Queen's Park, were broken. At the Buckle—the unfortunate Buckle—the windows were riddled, and nearly every pane of glass in the Buckle Inn was smashed. Much poultry was killed.

The phenomenon, for only as such can it be described, occurred about a quarter to seven p.m. The afternoon had been very hot and sultry, and a dense bank of black clouds had become massed in the south-west. About six o'clock the reverberations of a distant thunderstorm were heard; the storm gradually approached, and then a funnel-shaped cloud—apparently a water-spout—was seen to detach itself from the black mass in the south-west; it crossed the bay in a northerly direction with terrific rapidity, and heralded by a violent eddying wind, and accompanied by blinding flashes of lightning, it swept over the land, its track being marked with rolling volumes as of smoke, while there descended a tremendous shower of ice, the clatter of which was almost awe-inspiring by its strangeness. The full force of the storm, however, seems to have been felt along the Bishopstone Valley, and *even on Monday, Norton Top, with its covering of ice, glittered in the sunlight like an Alpine peak.* Chyngton and Sutton, on the other hand, were just on the edge of the path of the storm. The oldest inhabitants, some of whom have very prodigious memories, have no recollection of such a phenomenon in the past, and doubtless an account of the shower of ice on Sunday will be handed down to posterity as an interesting item in the annals of local history. Mr. W. R. Wynter, of Seaford, has on sale some exceedingly fine photographs of groups of the hailstones, which he has taken.

## SEAFORD.

A HAILSTORM of unusual violence was experienced at Seaford on Sunday evening—such a storm, in fact, as one hears of as occurring in other lands, but which one scarcely believes, and, unless seen, can hardly realise. The day had been beautifully fine, calm, and warm, but towards six o'clock a bank of clouds was seen to be moving up from the sea, and after a short time the appearance of these clouds was most peculiar. Suddenly there was a great gust of wind, and for two or three minutes great blocks of ice fell. Some of these exceeded six inches in circumference, while they weighed as much as two ounces each. They were of varied shape, some being round, others being long, but all were of immense size. The services at the various places of worship had just commenced, and the sound of the large blocks of ice falling on the roof reverberated through the buildings, so that the proceedings could scarcely be heard, while many of the congregation were considerably alarmed. Much damage was done to windows in the district, while the greenhouses suffered to a great extent, many of them having 50 and 100, or even more, panes broken. Such a storm has not been experienced by the oldest inhabitant.—*Brighton Observer*, June 4th.

## RIPE.

TERRIFIC HAILSTORM.—On Sunday evening a hailstorm of remarkable violence broke over the district of Ripe and Berwick, the hailstones being of exceptional size, some of them being almost round and measuring as much as two inches in diameter. Much damage was done to greenhouses and other glass

structures in the gardens, and many young ducks and geese were killed outright, while the older birds suffered terribly from the force of the hailstones, a number having their eyes completely smashed. The service in the Parish Church at Ripe had to be stopped for a time at the height of the storm, as it was quite impossible to hear anything in the church but the incessant rattling of the hailstones on the roof. The storm appears to have passed through the Cuckmere Valley, in a line from Seaford to Heathfield, reports of the fall of hailstones of abnormal size having been made at each of these places. Curiously enough, just at the mouth of the Cuckmere river scarcely any hail fell.

## SHORT NOTES TENDING TO DEFINE THE AREA OF THE STORM.

*Berwick.*—At Sherrington Manor the damage to glass is said to be £100.

*Brighton.*—No hail.

*Eastbourne.*—No hail.

*Hailsham.*—No hail.

*Jevington.*—No hail.

*Littlington.*—No hail of importance, and R only 0·04 in.

*Selmeston.*—Much damage was done here. Hail came down with terrific force. The stones were of enormous size, some measuring five inches in circumference, and weighing over an ounce. Panes of glass were broken in all directions, in cases of exposed cottages every pane being smashed, branches were broken off trees, young rooks were knocked dead from their nests, while ducks and fowls were killed in considerable numbers. Crops and vegetation suffered heavily.

## OTHER STORMS IN SUSSEX.

*Haywards Heath.*—The feature of the thunderstorm here was the heavy downpour of rain, which flooded the lower portions of the town, the water rushing along the roads like little rivers. The manholes in the Mill Green Road were forced up, the water spurting several feet.

*Wadhurst.*—A terrific storm of T and H, the latter being very large indeed, passed over here. Considerable damage was done to fruit trees and vegetables, the roads were strewn with fallen leaves, and scarcely a house in the town but had several windows broken. The storm appears to have been very local, as in some parts of the parish there was no hail.

## STORMS IN KENT THE SAME EVENING.

*Bexley Heath.*—This neighbourhood did not escape the severity of the storm on Sunday, but fortunately no serious damage resulted. A large limb of a tree in the Broadway was torn off by the severity of the storm.

*Dartford.*—Here, at Gravesend, and in the surrounding district, between seven and eight o'clock on Sunday evening, the storm occasioned darkness for a time, and there was a perfect deluge of rain. A large elm tree was blown down at Hawley, and considerable damage was done to the fruit trees in the neighbourhood, especially in the vicinity of Wilmington.

*Gillingham.*—At the Wesleyan Chapel two windows were broken with the hail, quite 1 in. in thickness. In Layfield Terrace, no fewer than 40 windows

were broken, and great damage was done in other outlying parts. The northern portion of the storm that passed over Strood-hill does not appear to have been so severe. In the town, except a few brilliant flashes of lightning and heavy claps of thunder, little was felt of the effects of the storm.

*Hunton.*—The hops on Stone Wall Farm escaped damage, but considerable injury was done to over 100 acres on the Hunton Court Estate, and about the same on Buston and Grove Farms. At Buston Farm the ground was covered with gooseberries. In several houses panes of glass were broken—at Mr. O. Foreman's no fewer than 15 squares were broken. Mr. Foreman says he found hailstones weighing an ounce.

*Maidstone.*—Soon after six a heavy mass of clouds congregated over the town, and lightning and thunder became excessively bright and loud, and hailstones fell as large as walnuts, doing immense damage. The storm travelled eastward from Maidstone, but opened and passed each side of Blue Bell-hill.

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## REMARKABLE HAILSTONES.

*To the Editor of the "Morning Post."*

SIR,—In reply to your Correspondent relative to remarkable hailstones, I may state that the same hailstorm passed over this town between seven and 7.30 p.m. on Sunday, May 30. The hailstones were similar in size to those your Correspondent describes. The noise of the hail was so great that the services in nearly all the churches were interrupted. I was myself taking Service at one of our district churches, and had to signal to the congregation to sit, as it was impossible to continue the hymn we were singing, no sound being heard of either music or voices above the clatter of the hail. It was accompanied by sharp flashes of lightning, but the thunder was inaudible from the same cause. Twenty minutes after the storm had ceased, when we came out from Service the hail stones were still lying in heaps by the roadside as large as shillings, and had rings of opaque white in the lumps of ice like cat's eyes. Great damage must have been done to the hops, and to glass, as well as to the fruit.—Yours, &c., E. DALISON.

*St. Michael's, Maidstone, June 9th.*

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*Rainham.*—Here and at Bredhurst, Boxley and New Brompton hailstones fell of an immense size. In New Brompton the streets were covered with these hailstones, which took some time to thaw.

*Sevenoaks.*—The storm on Sunday night was very keenly felt here. The water rushed in torrents down the hills, and the thunder was very loud, while the lightning was awfully vivid and frequent. A large tree in Hitchen Hatch-lane was struck by lightning, and fell right across the road. The Town Surveyor (Mr. J. Mann) at once employed some men to remove the obstruction, but this could not be done until the tree had been sawn into pieces, and the branches lopped off. Oak-lane was completely flooded for a short time.

*Tenterden.*—A thunderstorm of short duration passed over this neighbourhood on Sunday evening. An oak tree near Smallhythe School was struck by the lightning, having the bark on one side taken clean off. A sheep was killed in a field not far distant.

## STORMS AND DAMAGE IN OTHER COUNTIES.

NORTHAMPTON.—*Oundle.* The TS was so severe and the streets were so flooded that many persons could not leave the church after service.—*Peterborough.* Heavy TS, with much R, after 7 p.m.; streets flooded.

ESSEX.—*Clacton.* TS at 9 p.m., but not much R. *Colchester.* Brilliant L between 8 and 9 p.m.; not much R.

SUFFOLK.—*Bury St. Edmunds.* Sharp TS and heavy R about 9 p.m.

LINCOLN.—*Billingborough.* Heavy TS.—*Walcot.* Sheep killed by L.—*Deeping St. James.* Youth killed by L while driving, horse not hurt.

## GENERAL CONCLUSIONS.

Over England E. of a line from the Isle of Wight to Lincoln thunderstorms of more or less intensity occurred between 5 and 9 p.m. on May 30th.

The principal ones were in Kent and Sussex.

By far the most noteworthy occurred over an area less than 4 miles from E. to W., about midway between Newhaven and Beachy Head, and 8 miles from S. to N.; how much less than this area there is not at present evidence to prove.

Neither the T and L nor R was exceptional, but the H was so.

## THE SIZE OF THE HAILSTONES.

There is a general consensus of opinion that the circumference of the large ones exceeded 4 inches, and two different photographs sent to us give respectively 7·8 in. and 6·4 in. as the circumference—this of course gives a diameter of about 2 inches, and as they were mostly somewhat oval, we think that they must have been (as they appear in the photographs) very nearly the size of an ordinary hen's egg—say $2\frac{1}{4}$ in. by $1\frac{1}{2}$ in. by 1 in. They would, therefore, contain about 4 cubic inches of ice, and weigh very nearly 2 ounces each. It will be noticed that one writer says that ten weighed a pound—this would give 1·6 ounces each, and agrees very closely with our estimate of the size. We see that one is stated to have weighed "nearly a quarter of a pound," and another account says "three or four ounces." We have no doubt that the largest exceeded two ounces, and think that probably a very small number reached three ounces, but we see no evidence which will induce us to go to "four" ounces. In size, shape, and weight these stones seem to have closely resembled those which fell at Richmond, Surrey, August 3rd, 1879,* and at Richmond, Yorkshire, July 8th, 1893,† but if these falls are to be classed according to the magnitude of the stones, we think that Richmond, Surrey, would be first, and if by number of large stones, Richmond, Yorkshire, would be first. It is, however, certain that the Seaford fall was quite an exceptional event.

* *Met. Mag.*, Vol. XIV., p. 97.

† Russell, Rollo, *On Hail.* Photographs facing p. 224.

## HEAVY RAINFALL AT PORT ELIZABETH, CAPE COLONY, MAY 5TH, 1897.

FROM copies of the *Port Elizabeth Advertiser*, of May 8th, and of the *Cape Times*, of May 12th, with which we have been favoured, we have compiled the following note.

There had been a drought for some months in the neighbourhood of Port Elizabeth. On the night of Monday, May 3rd, the wind went to S.W., black clouds came up from the ocean, and there was steady rain, giving at the Hill station 0·53 in., up to 8 a.m. on the 4th. During the 4th, and up to 8 a.m. on the 5th, intermittent rain gave a total for the 24 hours of 1·34 in. It was raining hard at 9 a.m. on the 5th, but towards 11 a.m.

"the sky grew blacker away to the westward, and the rain began to come down in real earnest. At noon every street in the town was inundated, every sluit and gully was the course of a foaming torrent, and the low lying clouds were discharging their watery load in such amazing quantity that one would truly have believed that 'the fountains of the great deep were broken up and the windows of heaven opened.' The lower part of the town was for a couple of hours converted into a reservoir, fed by millions of gallons of rainwater plunging madly, feet deep, down every steep descent from the larger "catchment area" above the crest of the hill. Things were bad enough on the level surface above the Reserve, but the scene was tame compared with what we saw in every avenue leading to the lower level. The Park and all the district between the valley and the location, were a swamp. Rain fell absolutely in solid masses, and in finding level the floods of water did incalculable, almost incredible, damage. Down White's Road, Donkin Street, Constitution Hill, and Russell Road came seething, roaring, waist-deep cascades, ripping up roadways and footpaths and paved sluits like channels of sand; tearing great gaps in the surface, scooping out hundreds of tons of subsoil, laying bare and smashing gas and water mains and pipes, and hurrying along on their red and discoloured surface great boulders, beams of wood, lumps of asphalte, and everything that was loose, no matter what its weight, to deposit all this *débris* in wild confusion on the surface of Main and Strand Streets. In the former thoroughfare, about half-past twelve midday, the scene was really grand, though not without a touch of awe at this outbreak of Nature's resistless forces. Down every slope of road or lane were rushing muddy torrents, in many places waist-deep; the rain was driving along from the N.W. in sheets, forming a watery curtain which no eye could pierce for more than fifty yards; rocks and stones were being hurled into the middle of the road with the rattling roar one hears only on a shingle beach when heavy seas are breaking; on the low side the pent-up flood was finding its way into stores, cellars, hotels, and sheds, despite every effort to stay its inrush; and a few hardy people, drenched to the skin, gathered under the lee of corner buildings to watch the grandly-gloomy scene, or waded along the drowned footpaths, too wet to care for the extra soaking. So the storm raged for an hour or more, until a shift of wind to about N.E. brought relief; the surcharged clouds drove away out to sea, and by half-past one the sun was shining hotly in a clear sky. Such a waste of desolation in the leading thoroughfares of Port Elizabeth that same sun has never before shone upon. From Market Square to North End, Main Street at short intervals resembled

nothing so much as a stretch of rough foreshore—sand was deposited several inches deep on the lower side, while the roadway was strewn with (no exaggeration) hundreds and hundreds of tons of stones, boulders, and gravelly *detritus* washed down from above."

The rainfall between 8 a.m. and 1.30 p.m. on the 5th was 5·32 in., and the observer says that, but for the wind sweeping the rain over, rather than into, the gauge, the total would have been six inches in six hours.

During the ten years 1886–95, the largest yearly total was 27·94 in. in 1888, and in 1895 the total for the year was only 16·88 in.

At the Van Staaden Waterworks Reservoir the fall was much less, the fall on the 5th being 3·65 in., against a total at Hill station of 5·44 in. From the following little note the fall seems to have been local :—

RAINFALL.

The following rainfall returns, measured at eight a.m. on 4th, 5th, and 6th May, 1897, are supplied by the Meteorological Commission : Cape Agulhas, 0·20 inch ; Cape St. Francis, 3·75 inches ; Port Elizabeth, 7·29 inches ; East London, 0·75 inch ; Durban (5th), 0·30 inch.

## REVIEWS.

*The Great Lakes as a Sensitive Barometer.* By NAPIER DENISON. [Toronto, 1897], 8vo. Excerpt Proc. Canadian Institute.

*A Probable Solution of the Secondary Undulations found upon Self-recording Tide Gauges.* By NAPIER DENISON. [Toronto, 1897], 8vo. Excerpt Proc. Canadian Institute.

THESE are two early notes respecting a study of the seiches on Lake Huron, not merely in connection with the traces of a photographically recording barometer, but also with the weather types prevailing at the time over North America. The author is improving his appliances for observation by adding an extra sensitive barometer and in our opinion the inquiry is likely to bear good fruit. Mr. Denison's paper is, we think, the first in which the principal authorities upon the subject have been brought together—from Duillier in 1730 to De Saussure 1779, Vaucher 1804, Forel, Studer, Meyer, Favre, Veine, Guthrie, Kelvin, and Helmholtz. We can suggest one name—and one only—to be added to this list—viz., that of Mr. H. C. Russell, F.R.S., who has long been studying the oscillations of Lake George, which is about 130 miles S.W. of Sydney, New South Wales. In completing his work the author may find it useful to consult the paper by Sir John Lubbock "On the Fluctuation of High Water due to changes in the Atmospheric Pressure," (Phil. Mag. 1837, pp. 195, 196) ; J. C. Ross "On the effect of the Pressure of the Atmosphere on the Mean Level of the Ocean," with 2 plates, (London, 1854, 4to, 12 pag.) : Mr. W. H. Wheeler's report to the British Association (Liverpool, 1896), "On the effect of Wind and Atmospheric Pressure on the Tides," and a paper by M. F. L. Ortt, of The Hague, in *Nature*, May 27th, 1897.

## ROYAL METEOROLOGICAL SOCIETY.

THE monthly meeting of this Society was held on Wednesday afternoon, May 19th, at the Rooms of the Royal Astronomical Society, Burlington House, Mr. E. Mawley, F.R.H.S., President, in the chair.

The first paper read was by Mr. C. V. Bellamy, "*On the Rainfall of Dominica, West Indies.*" After a brief description of the physiography of the island, the author discussed at length the rainfall at about 20 stations for the four years 1893 to 1896, illustrating the distribution by a shaded map. The Trade Wind, blowing from the Atlantic and bearing a vast amount of aqueous vapour, is intercepted by the ranges of hills, so that the country on their windward or eastern slopes receives the greatest amount of rain, while that on the leeward or western side of the island is the driest. The map shows a mean fall over the western coast districts of from 60 to 90 inches, over the north, west, and south coast districts of from 100 to 150 inches, and over the central area, the fall is greater, probably exceeding 200 inches. Table VI. gives the mean monthly rainfall for the four years; it shows that the rainy season extends over the months of July, August, September, October, and November; the remaining seven months representing the dry season. The mean monthly rainfall varies from 4·46 in. in February to 15·84 in. in November. The author expresses the opinion that hurricanes are of less frequent occurrence now than formerly.

The second paper was by Mr. R. H. Scott, F.R.S., and Mr. F. Gaster, "*On the Mean Monthly Temperatures of the British Isles.*" The authors dealt with the means of the daily minimum, average, and maximum temperatures for the various months of the year, in the 25 years 1871—1895. They pointed out that there is a great difference between the amount of range of temperature at the coast stations and that recorded inland. The range between January and July amounts to about 16° at coast stations, but to more than 23° at inland stations. The contrast between the temperature of the air at inland and at coast stations at different times of the year is due to the following causes—(1) The constant tendency of the sun to heat the surface of the earth; (2) the equally constant tendency of the earth to radiate its heat into space—both of these being modified greatly by the aqueous vapour and the clouds suspended in the atmosphere; (3) the fact that the solid portions of the earth absorb and reflect heat much more rapidly than the water; and (4) that while the ocean to the westward is of enormous size and great depth, the sea to the eastward is, comparatively speaking, limited in area and shallow, and separates the eastern shores of the British Islands from those of continental Europe by only a small distance.

## CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, DECEMBER, 1896.

| STATIONS. (*Those in italics are South of the Equator.*) | Absolute. Maximum. Temp. | Absolute. Maximum. Date. | Absolute. Minimum. Temp. | Absolute. Minimum. Date. | Average. Max. | Average. Min. | Average. Dew Point. | Average. Humidity. | Absolute. Max. in Sun. | Absolute. Min. on Grass. | TotalRain. Depth. | TotalRain. Days. | Aver. Cloud. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ° | | ° | | ° | ° | ° | 0-100 | ° | ° | inches | | |
| England, London | 51·8 | 26 | 26·6 | 19 | 44·5 | 34·3 | 36·4 | 87 | 61·1 | 20·8 | 3·61 | 21 | 7·4 |
| Malta | 68·6 | 7 | 43·6 | 2 | 62·3 | 52·3 | 50·1 | 82 | 117·2 | 38·0 | 3·99 | 11 | 6·8 |
| *Mauritius* | 86·6 | 19*a* | 65·6 | 2 | 84·8 | 71·9 | 67·0 | 72 | 136·4 | 55·4 | 1·15 | 7 | 5·8 |
| Calcutta | 83·7 | 1 | 45·5 | 22 | 78·0 | 54·7 | 52·4 | 62 | 139·0 | 35·3 | ·00 | 0 | 2·0 |
| Bombay | 90·0 | 20 | 63·2 | 31 | 85·9 | 71·9 | 65·4 | 65 | 136·8 | 51·9 | ·00 | 0 | 2·5 |
| Ceylon, Colombo | 90·2 | ... | 70·5 | 14 | 87·5 | 74·0 | 72·5 | 81 | 146·0 | 68·0 | 11·76 | 22 | 6·2 |
| *Melbourne* | 98·9 | 23 | 47·0 | 15 | 78·3 | 56·3 | 52·6 | 63 | 153·8 | 35·0 | 1·16 | 6 | 5·5 |
| *Adelaide* | 104·4 | 22 | 48·0 | 7 | 83·6 | 59·3 | 50·8 | 50 | 164·0 | 37·0 | 1·48 | 4 | 3·8 |
| *Sydney* | 101·4 | 28 | 58·4 | 8 | 77·8 | 64·4 | 58·7 | 70 | 156·0 | 52·8 | 1·50 | 12 | 5·4 |
| *Wellington* | 77·0 | 29 | 44·0 | 25 | 68·1 | 56·1 | 53·0 | 72 | 133·0 | 35·0 | 2·61 | 8 | 4·3 |
| *Auckland* | 83·0 | 14 | 53·0 | 5 | 74·4 | 59·6 | 57·1 | 70 | 147·0 | 51·0 | ·88 | 6 | 4·0 |
| Jamaica, Kingston | 90·9 | 6 | 66·8 | 30 | 87·6 | 71·0 | 68·7 | 74 | ... | ... | 2·14 | 9 | ... |
| Trinidad | 91·0 | 2 | 67·0 | 27 | 87·0 | 70·1 | 72·2 | 82 | 167·0 | 66·0 | 6·33 | 15 | ... |
| Grenada | 86·0 | 4 | 71·0 | 1 | 82·3 | 73·5 | 72·6 | 81 | 155·0 | ... | 11·12 | 25 | 4·0 |
| Toronto | 48·9 | 12 | 1·1 | 23 | 33·8 | 21·3 | 24·2 | 80 | 60·0 | — 2·0 | ·95 | 9 | 7·1 |
| New Brunswick, Fredericton | 44·9 | 14 | —10·7 | 23 | 24·6 | 5·6 | 11·0 | 72 | ... | ... | 1·18 | 7 | 3·5 |
| Manitoba, Winnipeg | 40·0 | 11 | 32·7 | 1 | 20·6 | 0·8 | ... | ... | ... | ... | ·27 | 5 | 5·3 |
| British Columbia, Esquimalt | 55·0 | 8 | 29·0 | 16 | 46·8 | 38·5 | 41·8 | 95 | ... | ... | 10·41 | 24 | 8·8 |

*a*—and 21.

### REMARKS.

MALTA.—Adopted mean temp. 56°·5, or 0°·2 above the average. Mean hourly velocity of wind 11·4 miles. Thunderstorm and hail on 20th. Average temp. of sea 62°·5. J. F. DOBSON.

*Mauritius.*—Mean temp. of air 0°·4 above, of dew point 0°·9 below, and rainfall 3·84 in. below, their respective averages. Mean hourly velocity of wind 10·9 miles, equal to average; extremes, 24·7 on 20th and 1·6 on 22nd; prevailing direction, E.S.E. to E. by N. Lightning on 4th, 8th, and 29th. Rainfall the least fall in December from 1875 to 1896. T. F. CLAXTON.

CEYLON, COLOMBO.—Lightning was seen on 10th and 11th; thunderstorms occurred on 17th, 18th, and 19th. ALFRED E. WACKRILL.

*Adelaide.*—Mean temp. 0°·4 above the average of 39 years. The severe drought continued until early morning of 27th, ·72 in. of R being recorded at 9 a.m. 27th, and ·70 in. on 28th; the average for 39 years being ·85 in. C. TODD, F.R.S.

*Sydney.*—Rainfall 1·08 in. below, temp. 1°·2 above, and humidity 0·6 above, their respective averages. H. C. RUSSELL, F.R.S.

*Wellington.*—Early part generally fine, with occasional light rain; middle of month showery; latter part fine. Prevailing N.W. winds at times strong. R. B. GORE.

*Auckland.*—An exceedingly hot and dry December, the mean temp. being 4°·5 above the average, and the rainfall only one-third of the average.—T. F. CHEESEMAN.

JAMAICA, KINGSTON.—Mean hourly velocity of wind 3·2 miles. Rainfall of Kingston and the Island generally a little over the average. R. JOHNSTONE.

TRINIDAD.—Rainfall 1·52 in. above the 30 years' average. J. H. HART.

# SUPPLEMENTARY TABLE OF RAINFALL, MAY, 1897.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

| Div. | STATION. | Total Rain. | Div. | STATION. | Total Rain. |
|---|---|---|---|---|---|
| | | in. | | | in. |
| I. | Uxbridge (Harefield Pk.) | 1·32 | XI. | Rhayader, Nantgwillt ... | 1·73 |
| II. | Dorking, Abinger Hall . | 1·57 | ,, | Lake Vyrnwy ..... | 2·20 |
| ,, | Birchington, Thor ..... | ·71 | ,, | Corwen, Rhug ..... | ... |
| ,, | Hailsham ..... | 1·23 | ,, | Criccieth, Talarvor ..... | 1·35 |
| ,, | Ryde, Thornbrough ..... | 2·02 | ,, | I. of Man, Douglas ..... | 1·51 |
| , | Emsworth, Redlands ... | 1·44 | XII. | Stoneykirk, Ardwell Ho. | 1·89 |
| , | Alton, Ashdell ..... | 1·51 | ,, | New Galloway, Glenlee | 1·94 |
| III. | Oxford, Magdalen Col.. | ·92 | ,, | Moniavie, Maxwelton Ho. | 2·72 |
| ,, | Banbury, Bloxham ..... | 1·36 | ,, | Lilliesleaf, Riddell ..... | 1·45 |
| ,, | Northampton, Sedgebrook | ·83 | XIII. | N. Esk Res. [Penicuick] | 1·95 |
| ,, | Duddington [Stamford]. | 1·08 | XIV. | Glasgow, Queen's Park.. | 2·66 |
| ,, | Alconbury ..... | 1·40 | XV. | Inverary, Newtown ..... | 4·38 |
| ,, | Wisbech, Bank House... | ·80 | ,, | Oban, The Corran ..... | 3·64 |
| IV. | Southend ..... | 1·00 | ,, | Islay, Gruinart School... | 1·41 |
| ,, | Harlow, Sheering..... ... | 1·33 | XVI. | Dollar..... | 1·77 |
| ,, | Colchester, Lexden ..... | ·82 | ,, | Balquhidder, Stronvar... | 4·47 |
| ,, | Rendlesham Hall ..... | ·62 | ,, | Ballinluig ..... | 1·46 |
| ,, | Rushall Vicarage ..... | ·59 | ,, | Dalnaspidal H.R.S..... | 4·23 |
| ,, | Swaffham ..... | ... | XVII. | Keith H.R.S..... | 1·98 |
| V. | Salisbury, Alderbury ... | 1·41 | ,, | Forres H.R.S. ... ..... | 1·04 |
| ,, | Bishop's Cannings ..... | 1·13 | XVIII. | Fearn, Lower Pitkerrie.. | 1·49 |
| ,, | Blandford, Whatcombe . | 1·82 | ,, | N. Uist, Loch Maddy ... | 2·06 |
| ,, | Ashburton, Holne Vic... | 2·23 | ,, | Invergarry..... | 1·73 |
| ,, | Okehampton, Oaklands. | 1·74 | ,, | Aviemore H.R.S. ..... | 2·09 |
| ,, | Hartland Abbey ..... | 1·74 | ,, | Loch Ness, Drumnadrochit | 2·50 |
| ,, | Lynmouth, Glenthorne. | 1·46 | XIX. | Invershin ..... | 3·40 |
| ,, | Probus, Lamellyn ..... | 1·28 | ,, | Scourie ..... | ... |
| ,, | Wellington, The Avenue | 1·12 | ,, | Watten H.R.S..... | 1·35 |
| ,, | Wincanton..... | 1.98 | XX. | Dunmanway, Coolkelure | 2·63 |
| VI. | Clifton, Pembroke Road | 1·65 | ,, | Cork, Wellesley Terrace | 1·40 |
| ,, | Ross, The Graig ..... | 1·24 | ,, | Killarney, Woodlawn ... | 2·55 |
| ,, | Wem, Clive Vicarage ... | ·85 | ,, | Caher, Duneske ..... | 1·60 |
| ,, | Cheadle, The Heath Ho. | 1·51 | ,, | Ballingarry, Hazelfort... | 2·17 |
| ,, | Worcester, Diglis Lock | 1·03 | ,, | Limerick, Kilcornan ... | 1·24 |
| ,, | Coventry, Kingswood .. | 1·62 | ,, | Broadford, Hurdlestown | ... |
| VII. | Grantham, Stainby ..... | 1·11 | ,, | Miltown Malbay ..... | 2·12 |
| ,, | Horncastle, Bucknall ... | 1·22 | XXI. | Gorey, Courtown House | 1·18 |
| ,, | Worksop, Hodsck Priory | ·88 | ,, | Athlone, Twyford ..... | 1·39 |
| VIII. | Neston, Hinderton ..... | 1·12 | ,, | Mullingar, Belvedere ... | ·81 |
| ,, | Southport, Hesketh Park | 1·44 | ,, | Longford, Currygrane... | 1·89 |
| ,, | Broughton-in-Furness ... | 2·94 | XXII. | Woodlawn ..... | 2·29 |
| IX. | Ripon, Mickley..... | ·96 | ,, | Crossmolina, Enniscoe .. | 2·70 |
| ,, | Melmerby, Baldersby ... | 1·13 | ,, | Collooney, Markree Obs. | 2·51 |
| ,, | Scarborough, Observat'y | ·88 | ,, | Ballinamore, Lawderdale | ... |
| ,, | Middleton, Mickleton ... | 1·44 | XXIII. | Warrenpoint..... | 1·12 |
| X. | Haltwhistle, Unthank... | 1·67 | ,, | Seaforde..... | 1·56 |
| ,, | Bamburgh ..... | 1·72 | ,, | Belfast, Springfield ..... | 2·32 |
| ,, | Keswick, The Bank..... | 2·43 | ,, | Bushmills, Dundarave.. | 2·21 |
| XI. | Llanfrechfa Grange ..... | .. | ,, | Stewartstown ..... | 1·92 |
| ,, | Llandovery ..... | 1·64 | ,, | Killybegs ..... | 3·67 |
| ,, | Castle Malgwyn ..... | 1·43 | ,, | Lough Swilly, Carrablagh | 2·48 |
| ,, | Builth, Abergwesyn Vic. | 2·04 | | | |

# MAY, 1897.

| Div. | | STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.] | RAINFALL. Total Fall. | Difference from average 1880-9. | Greatest Fall in 24 hours Dpth | Greatest Fall in 24 hours Date | Days on which .01 or more fell. | TEMPERATURE. Max. Deg. | Max. Date | Min. Deg. | Min. Date. | No. of Nights below 32°. In shade. | On grass. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | inches. | inches. | in. | | | | | | | | |
| I. | ENGLAND. | London (Camden Square) ... | 1·08 | — ·82 | ·41 | 30 | 9 | 78·0 | 18 | 33·9 | 1 | 0 | 5 |
| II. | | Maidstone (Hunton Court)... | 1·21 | — ·17 | ·25 | 29 | 9 | ... | ... | ... | ... | ... | ... |
| ,, | | Strathfieldsaye ..... | 1·14 | ... | ·30 | 31 | 10 | ... | ... | ... | ... | ... | ... |
| III. | | Hitchin ..... ..... | 1·12 | — ·83 | ·32 | 30 | 11 | 69·0 | 25 | 31·0 | 12 | 3 | ... |
| ,, | | Winslow (Addington) ..... | ·85 | — 1·25 | ·21 | 31 | 11 | 72·0 | 25 | 32·0 | 4, 12 | 2 | 9 |
| IV. | | Bury St. Edmunds (Westley) | 1·26 | — ·49 | ·21 | 11 | 10 | 68·0 | 30 | 28·0 | 13 | ... | ... |
| ,, | | Norwich (Brundall) ..... | ·91 | ... | ·26 | 11 | 14 | 74·0 | 30 | 34·6 | 11 | 0 | 7 |
| V. | | Weymouth(LangtonHerring) | 1·42 | — ·19 | ·39 | 29 | 11 | 73·0 | 18 | 36·0 | 13 | 0 | ... |
| ,, | | Torquay (Cary Green) ... ..... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| ,, | | Polapit Tamar [Launceston].. | 1·39 | — ·44 | ·22 | 29 | 13 | 72·3 | 18 | 28·4 | 13 | 1 | 4 |
| VI. | | Stroud (Upfield) ..... | 1·52 | — ·52 | ·47 | 28 | 11 | 69·0 | 21 | 37·0 | 3 | 0 | ... |
| ,, | | ChurchStretton(Woolstaston) | 1·19 | — 1·68 | ·31 | 29 | 14 | 67·5 | 24 | 31·0 | 11 | 3 | 9 |
| ,, | | Tenbury (Orleton) ..... | 1·00 | — 1·55 | ·30 | 29 | 13 | 72·0 | 25 | 30·0 | 13 | 2 | 11 |
| VII. | | Leicester (Rotherby Hall) ... | 1·02 | ... | ·30 | 29 | 10 | ... | ... | ... | ... | ... | ... |
| ,, | | Boston ... ..... | 1·08 | — ·64 | ·55 | 30 | 9 | 75·0 | 31 | 31·0 | 12 | 1 | ... |
| ,, | | Hesley Hall [Tickhill]..... | 1·13 | — ·91 | ·54 | 31 | 13 | 71·0 | 21 | 31·0 | 12 | 2 | ... |
| VIII. | | Manchester(PlymouthGrove) | 1·85 | — ·50 | ·42 | 28 | 13 | 71·0 | 22*a* | 32·0 | 11 | 1 | 3 |
| IX. | | Wetherby (Ribston Hall) .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| ,, | | Skipton (Arncliffe) ..... | 3·31 | — ·41 | ·92 | 28 | 16 | ... | ... | ... | ... | ... | ... |
| ,, | | Hull (Pearson Park). ... ..... | 1·40 | — ·48 | ·48 | 29 | 10 | 68·0 | 31 | 31·0 | 11 | 2 | 2 |
| X. | | Newcastle (Town Moor) ..... | 1·21 | — ·54 | ·38 | 25 | 9 | ... | ... | ... | ... | ... | ... |
| ,, | | Borrowdale (Seathwaite)..... | 5·89 | — 2·72 | 1·27 | 4 | 19 | ... | ... | ... | ... | ... | ... |
| XI. | WALES. | Cardiff (Ely)..... | 1·30 | — 1·55 | ·31 | 29 | 11 | ... | ... | ... | ... | ... | ... |
| ,, | | Haverfordwest ..... ..... | 2·42 | + ·06 | ·70 | 27 | 13 | 75·3 | 18 | 36·0 | 4 | 0 | 3 |
| ,, | | Aberystwith (Gogerddan) ... | 2·37 | ... | ·57 | 27 | 13 | 74·0 | 18 | 23·0 | 12 | 11 | ... |
| ,, | | Llandudno..... ..... | 1·13 | — ·80 | ·31 | 28 | 14 | 67·5 | 31 | 39·8 | 11 | ... | ... |
| XII. | SCOTLAND. | Cargen [Dumfries] ..... ... | 2·60 | + ·08 | ·86 | 28 | 11 | 69·0 | 16*b* | 30·4 | 13 | 2 | ... |
| XIII. | | Edinburgh (Blacket Place)... | 1·28 | ... | ·40 | 28 | 14 | 67·9 | 31 | 33·9 | 13 | 0 | 6 |
| XIV. | | Colmonell ..... ..... | 1·40 | ... | ·39 | 25 | 12 | 74·0 | 19 | 27·0 | 12 | ... | ... |
| XV. | | Lochgilphead (Kilmory)..... | 3·21 | — ·14 | ·68 | 4 | 15 | ... | ... | 28·0 | 12 | 2 | ... |
| ,, | | Mull (Quinish)..... | 3·95 | + 1·00 | ·59 | 28 | 18 | ... | ... | ... | ... | ... | ... |
| XVI. | | Loch Leven Sluices ..... | 1·80 | — ·76 | ·50 | 29 | 9 | ... | ... | ... | ... | ... | ... |
| ,, | | Dundee (Eastern Necropolis) | 1.35 | — ·31 | ·50 | 28 | 14 | 65·8 | 30 | 32·0 | 7, 20 | 2 | ... |
| XVII. | | Braemar ..... .. | 2·30 | — ·11 | ·52 | 4 | 14 | 64·0 | 20*c* | 29·0 | 27 | 6 | 21 |
| ,, | | Aberdeen (Cranford) ... ..... | 2·39 | ... | ·85 | 28 | 17 | 62·0 | 31 | 30·0 | 3 | 2 | .. |
| ,, | | Cawdor (Budgate) ..... | 1·59 | — ·16 | ·38 | 26 | 14 | ... | ... | ... | ... | ... | ... |
| XVIII | | Strathconan [Beauly] ..... | 4·19 | + 1·10 | ·80 | 5 | 12 | ... | ... | ... | ... | ... | ... |
| ,, | | Glencarron Lodge..... | 5·71 | ... | ·82 | 4 | 19 | 68·0 | 21 | 30·5 | 13 | 4 | ... |
| XIX. | | Dunrobin ..... | 2·55 | + ·45 | ·49 | 30 | 17 | 59·0 | 5*g* | ... | ... | ... | ... |
| ,, | | S. Ronaldsay (Roeberry)..... | 1·57 | — ·15 | ·26 | 28 | 17 | 63·0 | 16 | 32·0 | 10 | 1 | ... |
| XX. | IRELAND. | Darrynane Abbey..... | 2·12 | ... | ·36 | 26 | 16 | ... | ... | ... | ... | ... | ... |
| ,, | | Waterford (Brook Lodge) ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... |
| ,, | | O'Briensbridge (Ross) ..... | 2·32 | ... | ·49 | 6 | 15 | ... | ... | ... | ... | ... | ... |
| XXI. | | Carlow (Browne's Hill) ..... | 1·62 | — ·72 | ·34 | 6 | 12 | ... | ... | ... | ... | ... | ... |
| ,, | | Dublin (FitzWilliam Square) | 1·14 | — ·79 | ·27 | 6 | 14 | 63·6 | 16 | 36·2 | 6 | 0 | 0 |
| XXII. | | Ballinasloe ..... ..... | 1.50 | — 1·19 | ·25 | 6 | 15 | 68·0 | 21*d* | 36·0 | 11*f* | 0 | ... |
| ,, | | Clifden (Kylemore) ..... .. | 5·03 | ... | ·82 | 30 | 17 | ... | ... | ... | ... | ... | ... |
| XXIII | | Waringstown ..... | 2·47 | + ·03 | ·36 | 26 | 16 | 74·0 | 16*e* | 32·0 | 3*f* | 2 | 10 |
| ,, | | Londonderry (Creggan Res.). | 2·86 | + ·34 | ·73 | 28 | 19 | ... | ... | ... | ... | ... | ... |
| ,, | | Omagh (Edenfel) ..... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

+Shows that the fall was above the average ; —that it was below it.

*a*—and 23. *b*—and 22. *c*—and 21. *d*—and 22, 23. *e*—and 17, 21, 22, 24. *f*—and 13. *g*—and 6, 31.

# METEOROLOGICAL NOTES ON MAY, 1897.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail S for Snow.

## ENGLAND.

ADDINGTON.—The third May in succession with a small rainfall, very little falling until after the 25th. The low night temp. kept vegetation much in check, but there was no frost severe enough to destroy anything. One peal of T was heard on the 25th, at 2.50 p.m., and T with R on the 26th. Shower of H in the neighbourhood on the 28th.

BURY ST. EDMUNDS, WESTLEY.—A cold month, with harsh N.E. winds and sharp frost on 13th; very unfavourable for vegetation. H on 6th and 11th. TSS on 25th and 30th. Distant T on 11th and 28th.

NORWICH, BRUNDALL.—A cold and changeable month, the second week being particularly unseasonable, with S on the 12th and H on the 11th, 12th, and 13th. T on the 25th and 30th, and L on the 30th and 31st.

WEYMOUTH, LANGTON HERRING.—For the first fifteen days of the month the weather was cold and dry, and up to the 24th only ·33 in. of R fell, but 1·09 in. in the last week refreshed the fields and gardens, which were parched by a long continuance of N.E. winds. The mean temp. at 9 a.m. (52°·7) is 1°·4 below the average of 25 years. Solar halo on the 17th. TS on the 19th. For the first five months of the year the rainfall is 47 per cent. above the average.

POLAPIT TAMAR [LAUNCESTON].—A rather unseasonable month on the whole; very dry during the day for the first three weeks, but cold at night. Easterly winds prevailed during the greater part of the month. A sharp frost on the morning of the 13th did considerable damage to vegetation.

STROUD, UPFIELD—Snowstorm about 6 a.m. on 11th.

WOOLSTASTON.—A very cold and dry month. Violent storm of H on 11th, followed by S. Mean temp. 50°·6.

TENBURY, ORLETON.—A very dry month, with temp. slightly below the average. The first part of the month was very cold, with frequent frosts, which did much damage to the fruit. A very large proportion of cold N. and N.E. wind.

SKIPTON, ARNCLIFFE.—A rather dry month, with cold N. and N.E. winds.

HULL, PEARSON PARK.—H on 6th, 26th, and 28th; TS on 29th, and T on 6th, 28th, 30th, and 31st.

## WALES.

HAVERFORDWEST.—The first week was in pleasant sequence with the last month; a drought then set in, with strong easterly and north-easterly breezes amounting at times to the force of half a gale. The dryness of the air was remarkable, particularly so as evidenced by the readings of the wet and dry bulb from the 17th to the 24th; on the 17th the 9 a.m. readings of the hygrometer differed 13°·2, and on the other days varied from 8° to 10°; large ponds of water evaporated like magic, and had not the much-prayed-for R come, the hay and other crops would again have proved a disastrous failure. H storm on 30th, at 3.30 a.m., ·35 in. fell in 15 minutes.

ABERYSTWITH, GOGERDDAN.—Bright sunshine, with drying E. wind, from the 14th to 24th. Springs very low, but nice rains in the last few days.

## SCOTLAND.

CARGEN [DUMFRIES].—Although the temp. was very appreciably lower and the R much greater than in May of 1895 and 1896, the figures representing the meteorological conditions of the past month are chiefly remarkable as showing how very closely they correspond with the averages for May in the last 38 years. The unpleasant weather experienced in April continued during the earlier portion of May; from the 1st to the 13th the mean temp. was 45°·1, and sleet and H showers were of frequent occurrence. A welcome change took place about the middle of the month, but the effects of the higher temp (51°·9 14th to 31st) were marred by a constant succession of parching easterly winds, pastures and corn crops making little progress. A change of wind and nearly two inches of R during the last week effected marked improvement. Farm work is well advanced, but the R, it is feared, arrived too late to ensure a heavy hay crop, and pastures have seldom been barer at the close of May. The oak was just bursting into leaf at the close (this year behind the ash), and the hawthorne commencing to flower, being, with flowering shrubs generally, fully three weeks later than in the past two years. H on 4th. T in afternoon of 27th.

EDINBURGH, BLACKET PLACE.—H on 10th and 11th. Fogs on 20th, 27th, and 28th. Gale on 4th; and rainbow at 6.30 p.m. on 4th.

COLMONELL.—Rainfall 1·05 in. below, and mean temp. 0°·9 below, the averages of 21 years. T on 27th.

BRAEMAR.—Another cold and backward month.

ABERDEEN, CRANFORD.—The month was cold, with high winds and little sunshine.

CAWDOR, BUDGATE.—S and H on 6th; H also on 5th, 10th and 11th.

S. RONALDSAY, ROEBERRY.—The first half of the month was wet and very cold, the last half warmer. Mean temp. 48°·9, 1° above the average of seven years.

## IRELAND.

DARRYNANE ABBEY.—A showery month, with a week of very fine, hot weather in the middle.

O'BRIENSBRIDGE, ROSS.—Wintry and cold up to the 11th, followed by brilliant sunny days until the 24th, and closing with another change to R and cold.

DUBLIN.—A cold, rather dry month, very showery at the beginning and close, fine and bright in the intervening period, with absolute drought from 12th to 24th inclusive. The prevailing winds were from polar quarters, N.W., N.E., and E. Mean temp. 50°·9, or 1°·1 below the average. Solar halo on the 24th. High winds on 12 days, attaining the force of a gale from W.S.W. on the 4th; slight fog on 20th. H on 5 days.

BALLINASLOE.—L and T at 1.45 p.m. on 29th.